
OVHD
EXIT

1
00:00:07,349 --> 00:00:04,070
station this is houston are you ready

2
00:00:07,359 --> 00:00:10,230
i'm ready

3
00:00:20,550 --> 00:00:12,470
cases this is mission control houston

4
00:00:29,349 --> 00:00:23,349
station this is greg johnson at the bio

5
00:00:34,069 --> 00:00:31,750
i read you good enough uh box it's a

6
00:00:41,590 --> 00:00:34,079
little bit of an echo but uh good enough

7
00:00:47,670 --> 00:00:44,150
okay scott i want to tell you how very

8
00:00:50,310 --> 00:00:47,680
excited personally and professionally i

9
00:00:52,709 --> 00:00:50,320
am to be sharing you with the audience

10
00:00:54,229 --> 00:00:52,719
here at bio we have an audience of

11
00:00:57,910 --> 00:00:54,239
3 000

12
00:01:00,470 --> 00:00:57,920
cto's ceos of biotech companies it's the

13
00:01:06,230 --> 00:01:00,480

greatest conference of the year

14
00:01:11,270 --> 00:01:09,270
well i'm in the u.s laboratory module of

15
00:01:13,590 --> 00:01:11,280
the international space station which

16
00:01:16,630 --> 00:01:13,600
the space station itself is currently

17
00:01:18,950 --> 00:01:16,640
flying over australia and it's uh it's

18
00:01:21,510 --> 00:01:18,960
night time there so it's dark outside

19
00:01:23,109 --> 00:01:21,520
but this u.s laboratory module is one of

20
00:01:25,830 --> 00:01:23,119
many modules we have on the space

21
00:01:27,910 --> 00:01:25,840
station it's the primary science module

22
00:01:29,749 --> 00:01:27,920
on the what's called the u.s operational

23
00:01:31,270 --> 00:01:29,759
segment of the space station but there

24
00:01:32,710 --> 00:01:31,280
are other science modules as well

25
00:01:35,190 --> 00:01:32,720
there's a european

26
00:01:36,870 --> 00:01:35,200
uh space agency module and the uh

27
00:01:39,270 --> 00:01:36,880
science module and the japanese have a

28
00:01:41,190 --> 00:01:39,280
very large science module

29
00:01:42,710 --> 00:01:41,200
and we do research on other parts of the

30
00:01:45,350 --> 00:01:42,720
space station not only inside but

31
00:01:52,069 --> 00:01:45,360
outside and on the russian segment as

32
00:01:56,550 --> 00:01:54,389
yes scott i saw your brother mark last

33
00:01:58,389 --> 00:01:56,560
weekend at the commissioning of the uss

34
00:02:01,190 --> 00:01:58,399
gabrielle giffords i appreciate you

35
00:02:02,069 --> 00:02:01,200
tweeting and acknowledging that very

36
00:02:04,230 --> 00:02:02,079
uh

37
00:02:05,830 --> 00:02:04,240
that great honor that she deserved for

38
00:02:09,029 --> 00:02:05,840

her courage and service

39
00:02:10,790 --> 00:02:09,039
um and i've got another uh message from

40
00:02:13,030 --> 00:02:10,800
him that i may or may not pass a little

41
00:02:14,470 --> 00:02:13,040
later in this transmission but to get

42
00:02:15,270 --> 00:02:14,480
started

43
00:02:16,869 --> 00:02:15,280
um

44
00:02:19,190 --> 00:02:16,879
what do you hope

45
00:02:26,550 --> 00:02:19,200
to accomplish in this one year mission

46
00:02:30,390 --> 00:02:28,949
well you know there are the

47
00:02:33,509 --> 00:02:30,400
you know the mission objectives i hope

48
00:02:36,070 --> 00:02:33,519
to accomplish but you know my primary uh

49
00:02:38,229 --> 00:02:36,080
uh goal i guess i would say is you know

50
00:02:40,470 --> 00:02:38,239
do this in a very professional manner

51
00:02:41,990 --> 00:02:40,480
for it to be very safe

52
00:02:42,790 --> 00:02:42,000
um

53
00:02:45,030 --> 00:02:42,800
and

54
00:02:46,470 --> 00:02:45,040
you know after that you know our mission

55
00:02:48,630 --> 00:02:46,480
objectives which are very very important

56
00:02:51,110 --> 00:02:48,640
and there's different kinds

57
00:02:53,589 --> 00:02:51,120
of objectives some are science uh some

58
00:02:54,949 --> 00:02:53,599
are more operational in nature but i'm

59
00:02:58,550 --> 00:02:54,959
sure you guys are interested in the

60
00:03:00,390 --> 00:02:58,560
science part of this uh this flight and

61
00:03:02,630 --> 00:03:00,400
you know while i'm up here there's in

62
00:03:04,790 --> 00:03:02,640
this course of a year there's only over

63
00:03:05,990 --> 00:03:04,800

400 different scientific experiments

64
00:03:07,589 --> 00:03:06,000
going on

65
00:03:10,149 --> 00:03:07,599
and you know they're in all kinds of

66
00:03:11,350 --> 00:03:10,159
disciplines some are are exploration

67
00:03:13,509 --> 00:03:11,360
based

68
00:03:16,470 --> 00:03:13,519
um and a lot of those are nasa type

69
00:03:18,390 --> 00:03:16,480
research but the cases research as as

70
00:03:21,110 --> 00:03:18,400
you are probably more aware than i am is

71
00:03:23,270 --> 00:03:21,120
uh you know more uh

72
00:03:24,789 --> 00:03:23,280
related to how how to improve life on

73
00:03:27,030 --> 00:03:24,799
earth and uh

74
00:03:29,589 --> 00:03:27,040
and some of that is with regards to this

75
00:03:31,670 --> 00:03:29,599
uh you know biotech industry and

76
00:03:33,830 --> 00:03:31,680
you know the the study that we're doing

77
00:03:36,149 --> 00:03:33,840
with me and misha on this one-year

78
00:03:38,789 --> 00:03:36,159
mission and then also with my brother on

79
00:03:41,589 --> 00:03:38,799
this uh on this twin study

80
00:03:44,149 --> 00:03:41,599
has a lot of applications to

81
00:03:46,070 --> 00:03:44,159
uh things on earth with regards to to

82
00:03:48,949 --> 00:03:46,080
our health and you know trying to

83
00:03:51,030 --> 00:03:48,959
improve our health as we age because you

84
00:03:52,149 --> 00:03:51,040
know things change up here much more

85
00:03:54,630 --> 00:03:52,159
rapidly

86
00:03:57,110 --> 00:03:54,640
so uh you know i hope to accomplish all

87
00:03:59,270 --> 00:03:57,120
those those goals um you know there are

88
00:04:02,149 --> 00:03:59,280

specific things i hope we learn from it

89
00:04:05,030 --> 00:04:02,159
but in a general sense you know get all

90
00:04:12,869 --> 00:04:05,040
that accomplished do it safely and you

91
00:04:17,670 --> 00:04:15,030
thank you scott and scott referred to

92
00:04:19,590 --> 00:04:17,680
cases the center for the advancement of

93
00:04:22,230 --> 00:04:19,600
science and space and i'm their

94
00:04:24,790 --> 00:04:22,240
executive director and in cooperative

95
00:04:27,749 --> 00:04:24,800
agreement with nasa we're furthering

96
00:04:30,070 --> 00:04:27,759
nasa's mission uh on this international

97
00:04:32,950 --> 00:04:30,080
space station so we're attracting

98
00:04:35,510 --> 00:04:32,960
new and innovative users commercial

99
00:04:36,629 --> 00:04:35,520
users developing commercial demand

100
00:04:39,430 --> 00:04:36,639
for this

101
00:04:42,310 --> 00:04:39,440
low earth orbit commercial market

102
00:04:45,350 --> 00:04:42,320
and biotech is right in the middle of it

103
00:04:48,390 --> 00:04:45,360
so so from what i understand then scott

104
00:04:51,670 --> 00:04:48,400
um as far as the twin studies concerned

105
00:04:54,150 --> 00:04:51,680
and under and the year-long mission

106
00:04:57,030 --> 00:04:54,160
nasa's portion of the mission is to go

107
00:04:59,510 --> 00:04:57,040
to the moon go to mars

108
00:05:01,430 --> 00:04:59,520
explore the universe

109
00:05:03,350 --> 00:05:01,440
but nasa also has a mission and that's

110
00:05:04,469 --> 00:05:03,360
where we come in to complement their

111
00:05:08,150 --> 00:05:04,479
mission

112
00:05:11,749 --> 00:05:08,160
is to solve problems here on the earth

113
00:05:14,310 --> 00:05:11,759

and so um you know as we try to

114
00:05:15,749 --> 00:05:14,320
understand how the body reacts uh in

115
00:05:18,070 --> 00:05:15,759
microgravity

116
00:05:20,390 --> 00:05:18,080
um we're going to learn how to live in

117
00:05:21,590 --> 00:05:20,400
space for longer durations

118
00:05:24,150 --> 00:05:21,600
so scott

119
00:05:26,550 --> 00:05:24,160
can you describe some of the physical

120
00:05:29,430 --> 00:05:26,560
characteristics that change

121
00:05:30,790 --> 00:05:29,440
uh when you're in space i have a funny

122
00:05:32,870 --> 00:05:30,800
story with your brother that i won't

123
00:05:35,350 --> 00:05:32,880
share but what are some other things

124
00:05:37,590 --> 00:05:35,360
that you can share with us that change

125
00:05:41,350 --> 00:05:37,600
when you live for long periods of time

126
00:05:44,550 --> 00:05:42,870
all right so so i have some stories

127
00:05:46,550 --> 00:05:44,560
about you i won't share either then but

128
00:05:49,110 --> 00:05:46,560
i was thinking of it but since you won't

129
00:05:52,070 --> 00:05:49,120
share those that my brother told

130
00:05:53,749 --> 00:05:52,080
you i won't share my stories about you

131
00:05:54,790 --> 00:05:53,759
so yeah there are a lot of things that

132
00:05:56,150 --> 00:05:54,800
change

133
00:05:56,950 --> 00:05:56,160
on our uh

134
00:05:59,189 --> 00:05:56,960
you know

135
00:06:02,070 --> 00:05:59,199
with our physiology in space that's

136
00:06:05,110 --> 00:06:02,080
similar to how people change

137
00:06:07,909 --> 00:06:05,120
as they age you know the number one

138
00:06:09,670 --> 00:06:07,919

one that people talk about and that

139
00:06:12,469 --> 00:06:09,680
you know we've researched up here for a

140
00:06:14,870 --> 00:06:12,479
long time is bone loss uh that occurs

141
00:06:16,550 --> 00:06:14,880
much more rapidly in space

142
00:06:19,189 --> 00:06:16,560
than it does on earth and it's something

143
00:06:21,430 --> 00:06:19,199
similar to what you know an elderly

144
00:06:23,189 --> 00:06:21,440
person might experience and from

145
00:06:24,710 --> 00:06:23,199
understanding uh

146
00:06:27,749 --> 00:06:24,720
you know the mechanism behind this in

147
00:06:31,189 --> 00:06:27,759
space and and how to mitigate it uh we

148
00:06:33,510 --> 00:06:31,199
can develop uh new drugs uh to prevent

149
00:06:35,909 --> 00:06:33,520
that new uh methodologies

150
00:06:37,909 --> 00:06:35,919
and that's actually been accomplished

151
00:06:40,309 --> 00:06:37,919
already there are things there there's a

152
00:06:42,550 --> 00:06:40,319
drug on the market that was uh

153
00:06:45,749 --> 00:06:42,560
you know the direct result of research

154
00:06:48,230 --> 00:06:45,759
that was conducted on the space station

155
00:06:49,589 --> 00:06:48,240
same thing with muscles we you know if

156
00:06:51,830 --> 00:06:49,599
we didn't do anything about it we would

157
00:06:53,189 --> 00:06:51,840
lose muscle mass up here now fortunately

158
00:06:55,670 --> 00:06:53,199
we have some good exercise equipment

159
00:06:57,990 --> 00:06:55,680
that prevents that but also from you

160
00:06:59,830 --> 00:06:58,000
know how that uh you know process occurs

161
00:07:02,629 --> 00:06:59,840
here we can learn things about different

162
00:07:05,990 --> 00:07:02,639
types of muscle wasting diseases and not

163
00:07:07,830 --> 00:07:06,000

just learn them with uh with people uh

164
00:07:10,629 --> 00:07:07,840
you know just today i was cleaning up

165
00:07:12,790 --> 00:07:10,639
from our cases rodent research we were

166
00:07:14,469 --> 00:07:12,800
doing here over the last couple of

167
00:07:16,550 --> 00:07:14,479
months and it was very very interesting

168
00:07:17,589 --> 00:07:16,560
very successful

169
00:07:19,029 --> 00:07:17,599
and

170
00:07:21,029 --> 00:07:19,039
you know there's a lot we're going to

171
00:07:24,070 --> 00:07:21,039
learn from that i think but we also

172
00:07:26,070 --> 00:07:24,080
uh demonstrated our ability to do that

173
00:07:28,230 --> 00:07:26,080
type of animal research on board the

174
00:07:31,270 --> 00:07:28,240
space station which i understand

175
00:07:33,029 --> 00:07:31,280
is a you know critical to many of the

176
00:07:34,790 --> 00:07:33,039
different kinds of uh you know

177
00:07:37,110 --> 00:07:34,800
treatments and drugs and things that are

178
00:07:37,990 --> 00:07:37,120
developed for for people

179
00:07:40,550 --> 00:07:38,000
uh

180
00:07:42,790 --> 00:07:40,560
you know to treat treat their problems

181
00:07:43,589 --> 00:07:42,800
we have an eye issue for instance that

182
00:07:45,350 --> 00:07:43,599
uh

183
00:07:46,950 --> 00:07:45,360
you know as you asked the earlier

184
00:07:48,869 --> 00:07:46,960
question one what's one of the things i

185
00:07:50,469 --> 00:07:48,879
hope to learn and that's one of the

186
00:07:51,350 --> 00:07:50,479
things you know being up here for a long

187
00:07:53,350 --> 00:07:51,360
time

188
00:07:55,189 --> 00:07:53,360

uh we're and we're doing some pretty

189
00:07:56,790 --> 00:07:55,199
cutting edge research in that regard

190
00:07:59,510 --> 00:07:56,800
doing

191
00:08:01,909 --> 00:07:59,520
a bunch of imaging ultrasound a bunch of

192
00:08:04,629 --> 00:08:01,919
other scans on our um

193
00:08:07,589 --> 00:08:04,639
our the structure of our eye these uh

194
00:08:09,909 --> 00:08:07,599
devices oct tonometry while we're in

195
00:08:12,710 --> 00:08:09,919
this russian low lower body negative

196
00:08:14,950 --> 00:08:12,720
pressure device

197
00:08:20,309 --> 00:08:17,350
you know those three things the effects

198
00:08:22,309 --> 00:08:20,319
of you know radiation on our physiology

199
00:08:24,230 --> 00:08:22,319
is another important one and the study

200
00:08:25,830 --> 00:08:24,240
i'm doing with my brother the twin study

201
00:08:27,510 --> 00:08:25,840
is going to look at you know how this

202
00:08:30,150 --> 00:08:27,520
environment including the radiation

203
00:08:32,070 --> 00:08:30,160
affects us on a genetic level so you

204
00:08:33,829 --> 00:08:32,080
know this is really an incredible

205
00:08:35,829 --> 00:08:33,839
facility we have up here a lot of

206
00:08:38,630 --> 00:08:35,839
capability especially with the animal

207
00:08:40,469 --> 00:08:38,640
research we have now especially

208
00:08:42,469 --> 00:08:40,479
also with uh you know the imaging

209
00:08:44,389 --> 00:08:42,479
technology the ability to do ultrasounds

210
00:08:45,750 --> 00:08:44,399
up here and other types of imaging is

211
00:08:47,829 --> 00:08:45,760
really

212
00:08:55,910 --> 00:08:47,839
turn this into a state-of-the-art

213
00:09:00,870 --> 00:08:58,150

scott as you described one of the great

214
00:09:03,910 --> 00:09:00,880
challenges is for us to

215
00:09:07,350 --> 00:09:03,920
uh take the best industry practices on

216
00:09:08,550 --> 00:09:07,360
the ground and translate those practices

217
00:09:10,870 --> 00:09:08,560
in space

218
00:09:12,790 --> 00:09:10,880
so we can take advantage of this

219
00:09:15,509 --> 00:09:12,800
one-of-a-kind asset

220
00:09:17,590 --> 00:09:15,519
asset that's up in space continuous

221
00:09:20,150 --> 00:09:17,600
microgravity

222
00:09:21,430 --> 00:09:20,160
you just can't get that here on the

223
00:09:23,030 --> 00:09:21,440
earth

224
00:09:24,230 --> 00:09:23,040
i'm going to slide ahead we're running

225
00:09:26,470 --> 00:09:24,240
out of time so i'm going to go to

226
00:09:28,870 --> 00:09:26,480
question number five i'd like you to

227
00:09:31,030 --> 00:09:28,880
talk a little bit about the commercial

228
00:09:34,310 --> 00:09:31,040
players up there i understand there's a

229
00:09:36,870 --> 00:09:34,320
couple commercial projects right now

230
00:09:39,350 --> 00:09:36,880
in the biotech uh you you talked about

231
00:09:42,150 --> 00:09:39,360
the muscle wasting project uh can you

232
00:09:45,269 --> 00:09:42,160
share any others uh that are up there

233
00:09:47,350 --> 00:09:45,279
because what we have here is an amazing

234
00:09:49,590 --> 00:09:47,360
opportunity through cases these

235
00:09:51,670 --> 00:09:49,600
commercial companies have access to the

236
00:09:57,509 --> 00:09:51,680
space station for the next nine and

237
00:10:02,310 --> 00:09:59,750
well like i said earlier there's uh

238
00:10:04,949 --> 00:10:02,320

there's while i'm here there's over 400

239
00:10:07,509 --> 00:10:04,959
different types of experiments and

240
00:10:09,430 --> 00:10:07,519
you know my primary responsibility is

241
00:10:12,630 --> 00:10:09,440
being the operator of these experiments

242
00:10:14,870 --> 00:10:12,640
which means uh you know doing what the

243
00:10:18,069 --> 00:10:14,880
principal investigator wants me to do it

244
00:10:20,150 --> 00:10:18,079
to do it per the procedure and you know

245
00:10:22,790 --> 00:10:20,160
get the research done and get the data

246
00:10:24,790 --> 00:10:22,800
and get it uh down to the ground so

247
00:10:26,550 --> 00:10:24,800
talking about uh specific biotech

248
00:10:29,590 --> 00:10:26,560
companies and uh

249
00:10:30,790 --> 00:10:29,600
and uh you know specific uh experiments

250
00:10:32,710 --> 00:10:30,800
of the

251
00:10:35,030 --> 00:10:32,720
400 that are on board i'm really not

252
00:10:37,269 --> 00:10:35,040
prepared to do that right now what i

253
00:10:40,069 --> 00:10:37,279
what i will say though is that we have

254
00:10:42,230 --> 00:10:40,079
some very skilled operators up here that

255
00:10:43,750 --> 00:10:42,240
uh you know one of their

256
00:10:46,710 --> 00:10:43,760
they're very well trained in their

257
00:10:48,310 --> 00:10:46,720
primary uh responsibility in this area

258
00:10:50,310 --> 00:10:48,320
is getting the science done the way the

259
00:10:52,550 --> 00:10:50,320
researcher wants and that's you know

260
00:10:54,630 --> 00:10:52,560
something that i uh

261
00:10:58,310 --> 00:10:54,640
i value i think is very important i

262
00:11:00,470 --> 00:10:58,320
think my colleagues share that and

263
00:11:02,550 --> 00:11:00,480

and you know it's one of the the great

264
00:11:03,829 --> 00:11:02,560
things about the space station is uh

265
00:11:05,590 --> 00:11:03,839
there's a lot of great things about this

266
00:11:12,550 --> 00:11:05,600
place but one of them obviously is the

267
00:11:17,829 --> 00:11:15,110
thank you scott um and we'll probably

268
00:11:20,630 --> 00:11:17,839
talk more about that uh the specific

269
00:11:23,110 --> 00:11:20,640
commercial examples uh for example merck

270
00:11:25,269 --> 00:11:23,120
has a project up there and others

271
00:11:26,870 --> 00:11:25,279
but we've got one more minute before i

272
00:11:29,350 --> 00:11:26,880
lose you

273
00:11:31,750 --> 00:11:29,360
what's one thing that we currently

274
00:11:34,310 --> 00:11:31,760
don't know that you hope to learn

275
00:11:39,430 --> 00:11:34,320
in the next nine or eight or nine months

276
00:11:43,990 --> 00:11:41,430
you know we've had people stay on the

277
00:11:46,230 --> 00:11:44,000
mir space station for a long period of

278
00:11:48,710 --> 00:11:46,240
time you know a year or a little bit

279
00:11:50,870 --> 00:11:48,720
longer but that was a long time ago and

280
00:11:53,110 --> 00:11:50,880
uh you know not only the russians but

281
00:11:54,629 --> 00:11:53,120
also us back then did not have the type

282
00:11:57,509 --> 00:11:54,639
of imaging

283
00:11:59,670 --> 00:11:57,519
technology and uh you know uh the

284
00:12:00,790 --> 00:11:59,680
ability to get the type of data that we

285
00:12:01,990 --> 00:12:00,800
can now

286
00:12:03,829 --> 00:12:02,000
on uh

287
00:12:05,829 --> 00:12:03,839
you know on our human health and

288
00:12:08,310 --> 00:12:05,839

performance and physiology

289
00:12:09,590 --> 00:12:08,320
and you know it's in the last 20 years

290
00:12:12,150 --> 00:12:09,600
it's really

291
00:12:14,629 --> 00:12:12,160
gr as the people in that room would know

292
00:12:16,470 --> 00:12:14,639
has really grown significantly so what i

293
00:12:17,990 --> 00:12:16,480
hope to learn is uh you know whether

294
00:12:18,870 --> 00:12:18,000
there's a cliff out there is there a

295
00:12:21,509 --> 00:12:18,880
cliff

296
00:12:23,990 --> 00:12:21,519
uh with regards to our physiology as we

297
00:12:24,710 --> 00:12:24,000
go from six months to a year or longer

298
00:12:27,030 --> 00:12:24,720
and

299
00:12:28,870 --> 00:12:27,040
if there is how do we mitigate those so

300
00:12:30,790 --> 00:12:28,880
we can explore

301
00:12:37,030 --> 00:12:30,800
further away from earth than we've gone

302
00:12:41,269 --> 00:12:39,350
well thank you very much for your time

303
00:12:51,430 --> 00:12:41,279
and at this point i'd like to turn it

304
00:12:56,629 --> 00:12:53,269
station this is houston acr that

305
00:13:00,949 --> 00:12:58,949
thank you cases in bio international